

## ABSTRACT OF THE DISCLOSURE

A deep cryogenic tempering process for brake components such as rotors and drums is provided, wherein the unique processing profile is dependent on properties of the specific brake components. The dependent properties include material, mass, and geometrical cross-section, among others, and as a result, application of the deep cryogenic tempering process to brake components results in significant improvements in performance and service life. In another preferred form, the present invention provides a brake component having an improved molecular structure as a result of undergoing deep cryogenic tempering, which results in improved structural properties such as improved warpage resistance and heat resistance, and reduced heat checking, fading, and cracking.